BJC/OR-1432

Transportation Plan for the Transport of ANSI N14.1-Compliant UF_6 Cylinders from the East Tennessee Technology Park to the Portsmouth Gaseous Diffusion Plant in Fiscal Year 2004

Rev. 2

March 2004

Transportation Plan for the Transport of ANSI N14.1-Compliant UF_6 Cylinders from the East Tennessee Technology Park to the Portsmouth Gaseous Diffusion Plant In Fiscal Year 2004

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Prepared for the
U.S. Department of Energy
Office of Environmental Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
East Tennessee Technology Park
Oak Ridge Y-12 Plant Oak Ridge National Laboratory
Paducah Gaseous Diffusion Plant Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

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ACRONYMS

ANSI	American National Standards Institute
BJC	Bechtel Jacobs Company LLC
CFR	Code of Federal Regulations
CVSA	Commercial Vehicle Safety Alliance
DOE	Department of Energy
DOT	Department of Transportation
DUF_6	Depleted Uranium Hexafluoride
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ETTP	East Tennessee Technology Park
FMCSR	Federal Motor Carrier Safety Regulations
GDP	Gaseous Diffusion Plant
HAZMAT	State-level hazardous materials
HMR	Hazardous Material Regulations
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
PEIS	Programmatic Environmental Impact Statement
PGDP	Paducah, Kentucky Gaseous Diffusion Plant
PORTS	Portsmouth, Ohio Gaseous Diffusion Plant
PPE	Personal Protective Equipment
PSS	Park (ETTP) or Plant (PORTS) Shift Superintendent
ROD	Record of Decision
SEC	Safety and Ecology Corporation
TDEC	Tennessee Department of Environment and Conservation
TEMA	Tennessee Emergency Management Agency
TEPP	Transportation Emergency Preparedness Program
TID	Tamper Indicating Device
TRANSCOM	Department of Energy's Tracking and Communication System
TRU	Transuranic
UDS	Uranium Disposition Services
UF_6	Uranium Hexafluoride
USEC	United States Enrichment Corporation
WAC	Waste Acceptance Criteria

Executive Summary

This plan summarizes transportation requirements, operations, organizational responsibilities, emergency management, public health and safety, and communication issues for implementation of the transport of American National Standards Institute (ANSI) N14.1-compliant uranium hexafluoride (UF_6) cylinders from the East Tennessee Technology Park to the Portsmouth Gaseous Diffusion Plant (PORTS) in the fiscal year 2004. Under this plan Bechtel Jacobs Company LLC (BJC) will ship only those cylinders that meet applicable Department of Transportation (DOT) regulatory requirements, including compliance with ANSI N14.1, for shipping without protective overpacks or with existing, readily available overpacks which do not require design and fabrication. The single exception is that cylinders shipped under DOT exemption E-11868 are shipped under this plan, and a second plan will be issued for all other ANSI-noncompliant cylinders. BJC will perform measurements, inspections, and analyses necessary to verify that the cylinders it ships meet all the requirements for shipping to PORTS. The surfaces of cylinders shipped by BJC in this campaign will be free of lead, PCBs or other contaminants at levels that would prevent compliance with DOT requirements. An appropriate combination of process knowledge and measurements will be employed to ensure that shipments by BJC are DOT-compliant. These shipments do not involve "Highway Route-Controlled Quantities," and are not subject to any laws that require specific routing, notifications, or escorts.

1. INTRODUCTION

Until recently, Department of Energy (DOE) and its predecessor-agencies were responsible for the enrichment of uranium used in both military and civilian applications. As a result of 50 years of uranium enrichment operations, depleted uranium hexafluoride (DUF_6) was created and subsequently stored in cylinders.

Most of the DUF_6 accumulated since the 1940s is stored in the locations where it was produced. These locations are the gaseous diffusion plants near Paducah, Kentucky (PGDP); Portsmouth, Ohio (PORTS); and at the East Tennessee Technology Park (ETTP), formerly K-25, at the Oak Ridge Reservation in Oak Ridge, Tennessee. Cylinders have been used in the uranium enrichment program since the late 1940s for the transportation as well as the storage of uranium hexafluoride (UF_6).

Gaseous Diffusion Plant (GDP) operations at the Oak Ridge facility ceased in 1985. On July 1, 1993, responsibility for uranium enrichment operations at the PORTS and PGDP facilities was transferred from DOE to the United States Enrichment Corporation (USEC). GDP operations were placed in cold standby at PORTS in 2001. However, DOE continues to execute its responsibility for the safe storage and ultimate disposition of all DUF_6.

On April 16, 1999, DOE issued the *Final Programmatic Environmental Impact Statement (PEIS) for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride* (DOE 1999). On August 2, 1999, the Secretary of Energy announced his Record of Decision (ROD), documenting the Department's plans for dealing with the national inventory of DUF_6. DOE decided to convert the DUF_6 inventory to a more stable form as quickly as is practicable. This decision is in accordance with the requirements of P.L. 105-204, which directs DOE to convert the UF_6 to a more stable chemical form, and the preferences expressed by stakeholders during the PEIS process. Because of this decision, DOE elected to build conversion plants at the location of the PGDP and PORTS GDPs. Because there are no plans to locate a conversion facility in Oak Ridge, Tennessee at the shut down GDP, the need was created to transport cylinders from that facility to one of the other GDP sites for conversion.

Portsmouth, Ohio and Paducah, Kentucky are equidistant (each approximately 300 miles) from Oak Ridge, Tennessee. There are approximately 57,000 storage cylinders containing over 500,000 metric tons of UF_6 at the ETTP, PGDP, and PORTS GDPs. Since there are more cylinders at PGDP (about 38,000), transporting the ETTP cylinders to PORTS would bring the inventories closer to a balance and this would facilitate the design and operation of two similarly sized conversion plants. On August 29, 2002, DOE awarded a conversion contract involving two plants to Uranium Disposition Services (UDS). The contract runs from August 29, 2002, to August of 2010. In September 2002, DOE informed BJC that shipment of the ETTP cylinders would be to the PORTS plant.

The Tennessee Department of Environment and Conservation (TDEC) and DOE signed Commissioner's Order 97-0378/98-H0023 on February 2, 1999, that states "DOE shall submit a plan containing schedules for activities that will ensure either removal of all known DUF_6 cylinders and their contents from ETTP or conversion of the contents of such cylinders will be completed by December 31, 2009." The terms of this order were recently summarized in TDEC's testimony to Congress. However, the ETTP closure plans provide for all cylinders to be removed from the site by the end of 2007, two years in advance of the consent order deadline. In finalizing the Accelerated Closure Contract for the ETTP in October 2003, DOE made the decision that BJC would have all responsibility for transporting

UF_6 cylinders from ETTP to Portsmouth, Ohio. BJC will be responsible for shipping ANSI N14.1-compliant cylinders in Fiscal Year 2004, and BJC will also be responsible for shipping all remaining ETTP cylinders in Fiscal Years 2005 through 2006.

Uranium hexafluoride has been shipped safely in the United States for over 40 years by truck, rail and barge. Historically, no transportation accidents involving a release of UF_6 have occurred.

2. SCOPE

Although this plan addresses only the ANSI N14.1-compliant cylinders, BJC will be responsible for shipping all cylinders, including those that are not DOT- and ANSI N14.1-compliant and may require the design, fabrication and deployment of overpacks not currently available. The scope of this plan addresses the portion of the shipping campaign involoving only ANSI-compliant cylinders, which is intended to be completed by October 1, 2004.

There are currently 5,951 UF_6 cylinders in the inventory at ETTP. These cylinders include many different designs and some that are overfilled and/or above the allowed internal pressure. Descriptions of the many cylinder designs can be found in USEC-651, *"The UF_6 Manual, Good Handling Practices for Uranium Hexafluoride,"* Rev. 8. Requirements for shipping uranium hexafluoride cylinders are contained in the U. S. Department of Transportation Hazardous Material Regulations (HMR), 49 CFR parts 100-185 and ANSI N14.1, *Uranium Hexafluoride - Packaging for Transport.* New HMR regulations for the packaging and transport of UF_6 were published in the Federal Register on January 26, 2004. Compliance with these regulations is voluntary until October 1, 2004, and mandatory thereafter. When references are made to compliance with DOT regulatory requirements in this plan, they refer to the mandatory DOT or NRC regulations now in effect, and not to the new voluntary regulations.

The types of cylinders at ETTP (Fig. 1) are shown in Table 1.

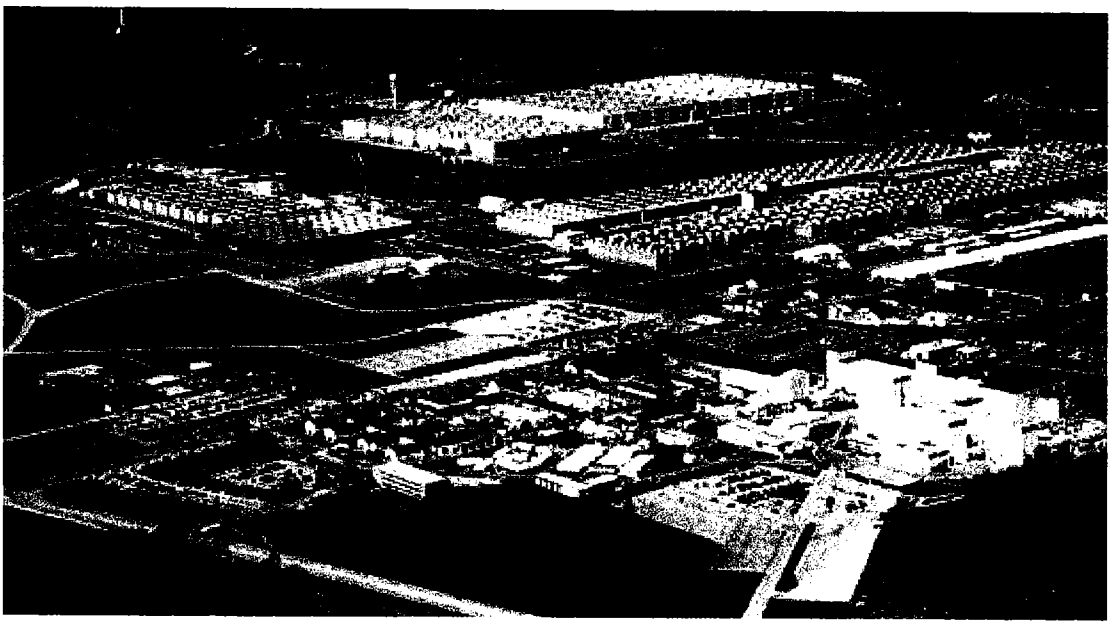

Fig. 1. East Tennessee Technology Park.

Table 1. Types of cylinders at the ETTP

Cylinder model	Shipping limit (lbs)	Material of construction
sample size (1S)	1	Nickel or Ni-Cu Alloy
sample size (2S)	4.9	Nickel or Ni-Cu Alloy
sample size (FAB-3)	not ANSI-listed	Stainless Steel
5" diameter (5A)	55	Nickel or Ni-Cu Alloy
8" diameter (8A)	255	Nickel or Ni-Cu Alloy
12" diameter (12A)	not ANSI-listed	Nickel
12" diameter (12B)	460	Nickel or Ni-Cu Alloy
30" diameter (30B)	5020	Steel
30" diameter (30A)	not ANSI-listed	Steel
48" diameter (48A, X, T, G, H, HX, O, OM, F, OH, OHI, and Y)	21030 – 27560	Steel

Table 2 shows the number of cylinders of each model type currently at ETTP.

Table 2. Number of cylinders by model currently at ETTP

Model/Description	Number at ETTP
1S (sample size)	66
2S (sample size)	24
Fabricated Samples (FAB-3, and others)	43
5A (5" diameter)	9
8A (8" diameter)	55
12A (12" diameter)	204
12B (12" diameter)	101
30A (30" diameter)	309
30B (30" diameter)	30
48A (thick-wall)	233
48X (thick-wall)	73
48T(thin-wall)	1479
48G	202
48H	6
48HX	6
48O	172
48OM	2853
48F(type OH & OHI Thick-wall)	85
48Y(thick-wall)	1
Total:	**5951**

Each of the models of cylinders that contain UF_6 is further classified according to their content's mass and enrichment in Uranium-235 (^{235}U). Cylinders with the lowest mass are classified in accordance with ANSI N14.1 and DOT HMR as "heel" quantities or as "empty cylinders."

Empty cylinders contain no UF_6 and many have been rinsed with a sodium bisulfite solution. Only about 20 of these cylinders remain at ETTP, and these will be transferred to a disposal site without chemical conversion.

The cylinders referred to as "heel" cylinders contain a very small amount of UF_6 and/or other uranium compounds as defined in the ANSI N14.1 and DOT HMR. To qualify as a heel, a cylinder's contents cannot exceed a prescribed maximum net weight. These weights are summarized in Table 3. Heels below the specified mass limit may be shipped without a protective overpack, without regard to assay, according to 49 Code of Federal Regulations (CFR) Subpart I, "Class 7 (Radioactive Materials)." Cylinders enriched above 1% and exceeding the specified heel mass limits must be overpacked or shipped in accordance with a valid DOT exemption. BJC will ship only those heel cylinders that meet all applicable ANSI N14.1 and mandatory DOT requirements. The shipment of heels after October 1, if any remain at the ETTP, will be addressed in the transportation plan for noncompliant cylinders. This plan envisions the shipment of ANSI N14.1-compliant heels to PORTS in 2004 after the site-specific EIS for conversion has been completed and the ROD has been issued for conversion, but prior to October 1, 2004. It is expected that the ROD for conversion will be issued on or before July 23, 2004. Shipping the heels, as well as the normal, and enriched assay cylinders to PORTS is intended to comply with ETTP closure requirements and schedule.

Table 3. Maximum allowable heel mass limits

Cylinder model/description	Maximum heel mass for shipping (lb)
1S (sample size)	n/a
2S (sample size)	n/a
5A (5" diameter)	0.1
5B (5" diameter)	0.1
8A (8" diameter)	0.5
12A (12" diameter)	1
12B (12" diameter)	1
30A (30" diameter)	25
30B (30" diameter)	25
48A (thick-wall)	50
48X (thick-wall)	50
48T(thin-wall)	50
48G	50
48H	50
48HX	50
48O	50
48OM	50
48F(type OH & OHI Thick-wall)	50
48Y(thick-wall)	50

The next higher mass cylinders are the partially full cylinders. These cylinders exceed the heel mass limits but are not filled to their maximum capacity (61% by volume for enriched assay and 62% for depleted). The ANSI N14.1 and mandatory DOT HMR shipping requirements for these cylinders are the same as the requirements for full cylinders.

Plans are in place to convert the material contained in 48-inch diameter depleted assay cylinders to a stable oxide (primarily U_3O_8) in the next twenty-five years. The ETTP cylinder population includes 48-inch diameter and smaller cylinders, including depleted, normal, and enriched assays in empty, heel, partially full, and full cylinders. Shipment of all types of nonempty cylinders from the ETTP to Portsmouth will consolidate the population at Portsmouth for economies of scale in disposition as well as fulfilling ETTP cleanup and regulatory commitments. Conversion at PORTS will produce additional heel cylinders as full cylinders are evacuated. ETTP heel cylinders shipped to PORTS will only represent 3% of the future cylinder inventory at PORTS, based on cylinder count. Likewise, enriched cylinders shipped from the ETTP to PORTS will represent only about 3% of the future PORTS cylinder count.

A portion of cylinders within the population to be shipped by BJC will require use of DOT Exemption E-11868 due to the type of tinning compounds used on valve threads. A copy of the exemption issued to USEC is provided as Appendix E of this plan. BJC has applied for and expects to be granted party status to the exemption as early as March 2004. Cylinders that employ Exemption E-11868 but are otherwise ANSI N14.1-compliant will be considered ANSI- and DOT-compliant for purposes of this plan. The tinning compound documentation and compliance issue does not pose a safety hazard for transport.

2.1 CYLINDERS MEETING ANSI N14.1 AND NOT REQUIRING AN OVERPACK

Shipments of full ANSI-compliant nonoverpacked cylinders to PORTS will begin in 2004 and is expected to be completed by October 1, 2004. Forty-eight-inch diameter full ten-ton or fourteen-ton cylinders are loaded on trucks with the Allied-Wagner NCH-35, a Gerlinger Straddle Carrier, or by crane. Cylinders are moved onsite at ETTP, such as between yards, with a straddle carrier (see Fig. 2). Interyard movement is required when a yard has no staging area to load trailers.

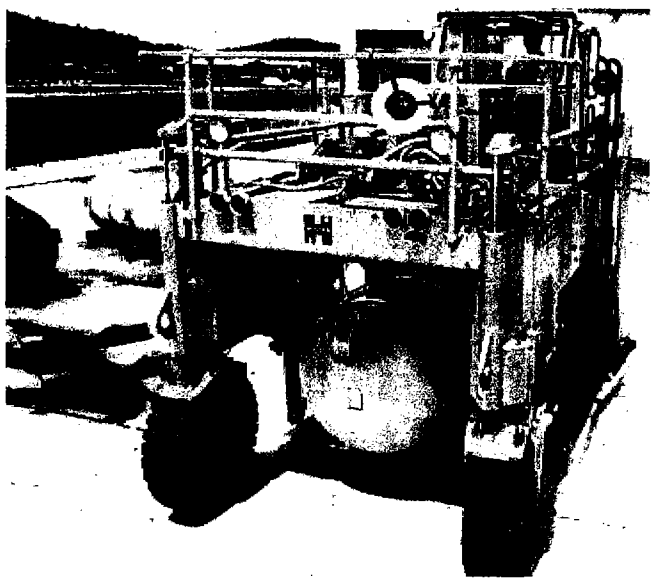

Fig. 2. Straddle carrier transporting a cylinder.

The typical steps involved with shipping full or partially-full cylinders (overpacking steps not included) are shown in Table 4.

Table 4. Cylinder shipping activity detail
(steps generally applicable to shipping large cylinders)

Steps
Pre-Move visual inspection
Unstack and/or relocate storage cylinders with approved handling equipment
Move cylinders to staging
ASME Code Vessel Inspection
Evaluation of "suspect" regions as needed
Dye penetration test if needed
Ultrasonic thickness measurements if needed
Cold pressure check
Replace valve if needed
Relieve pressure with HF capture if needed
Prepare Nuclear Materials Control & Accountability documentation
Cylinder contamination surveys
Decontamination and resurvey as necessary
Valve cover/TID seal installation
Conveyance inbound survey
Secure cylinders or overpacks on trailer
Perform transport index / outbound survey
Final tiedown inspection
Complete DOT shipping papers
Pre-transportation inspection, survey and release of conveyance

ANSI N14.1-compliant cylinders that will be shipped without an overpack in 2004 include enriched heels as well as cylinders of various other assays, and mass content. ANSI N14.1-compliant fissile cylinders greater than heel mass will be shipped in overpacks during the same time frame. Nonoverpacked full cylinders in this campaign other than 48-inch include some normal assay 30-inch and 12-inch diameter cylinders.

Heel cylinders can be loaded with a fork truck, and up to sixteen 30-inch or twelve 48-inch heels will fit on a flat bed trailer. Heels of 12-inch diameter and smaller can cumulatively be carried as one single additional truckload, or may be combined with other loads as weight allows and as convenient. Some of the small cylinders may be packaged in outer shipping containers and/or palletized for convenience of handling.

Limited sampling data indicate that roughly 2,900 nonempty cylinders probably meet DOT-required ANSI N14.1 criteria for shipping without an overpack (see Table 5). The actual number may vary substantially once inspections have been completed on each individual cylinder. Seventeen hundred of these are depleted-assay full cylinders.

Table 5. ANSI N14.1-compliant cylinders to be shipped to PORTS by BJC without overpacking

Number of cylinders	Cylinder size (diameter, inch)	Content	To be shipped	Truck loads
1700	48"	Full Depleted	2004	1700
1187	All Sizes	Full Normal, Partially Full or Heel in All Enrichments	2004	55
Total - 2887				**Total – 1755**

An additional 20 cylinders are classified as "empty" and these will be shipped to a disposal site in 2005. Several empty cylinders are or will be used as test weight, training, or temporary UF_6 holding vessels until all other cylinders have been removed from the ETTP.

Table 6. ANSI N14.1-compliant fissile cylinders to be shipped in overpacks by BJC

Number of cylinders	Size (diameter, inch)	Assay	Type of overpack	Shipping year	Truck loads
24	Sample	$\geq 1\%$	2000 MED	2004	.2
1	5	$\geq 1\%$	20PF-1 by BJC	2004	.1
27	8	$\geq 1\%$	20PF-2 by BJC	2004	.7
26	12	$\geq 1\%$	20PF-3 by BJC	2004	1.1
3	30	$\geq 1\%$	21PF-1A by BJC	2004	.4
12	12	$\geq 1\%$	20PF-3 by BJC	2004	.5
Total Cylinders:	**67**			**Total Truck Loads:**	**3**

2.2 CYLINDERS MEETING ANSI N14.1 AND REQUIRING AN OVERPACK

Shipment of ANSI N14.1-compliant cylinders requiring an overpack (due to assay and mass) is planned to take place under this plan prior to October 1, 2004. Protective overpacks have historically been used to increase the margin of safety during transportation of enriched UF_6. Currently approved overpack designs are listed in Table 7. Cylinders that will employ existing and fabricated overpacks are shown in Table 6.

Table 7. Currently approved overpacks for uranium hexafluoride transport

DOT Specification/ Certificate Number	NRC Certificate of Compliance Number	Model	Cylinder diameter (inch)	Maximum enrichment (%)	Maximum mass UF_6 (lb)
USA/0575/H(U)-96		2000-MED	1 .5	5.0	1
20PF-1			5	100.0	55
20PF-2			8	12.5	255
20PF-3			12	5.0	460
21PF-1A			30	5.0	4050[a]
21PF-1B					5020[b]
	9234	NCI-21PF-1	30	5.0	5020
	9196	UX-30	30	5.0	5020
	9284	ESP-30X	30	5.0	5020
	6553	Paducah Tiger	48	4.5	21,030[c]

[a] for the Model 30A cylinder
[b] for the Model 30B cylinder
[c] for the Model 48X cylinder

Many of the enriched partially full and full cylinders can employ existing industry standard DOT compliant overpacks without the need to obtain DOT exemptions, so long as these cylinders are shipped prior to October 1, 2004. BJC will not employ any exemptions other than that provided in Appendix E for shipping under this plan. All sizes of overpacks are needed for the estimated 67 fissile assay cylinders shown in Table 6.

The "Paducah Tiger" is the only overpack approved for transport of any 48-inch diameter cylinder. It is used primarily for transport between the Paducah and Portsmouth Gaseous Diffusion Plants. Use of the "Paducah Tiger" is limited exclusively to 10-ton heavy-wall cylinders that meet ANSI N14.1. No domestic packaging is currently available for 14-ton cylinders. The Paducah Tiger, NCI-21PF, and ESP-30-X are all deployed under Nuclear Regulatory Commission (NRC) certificates that expire during BJC's shipping campaign. No issues have been identified that would prevent renewal of these certificates, and BJC will ensure that these certificates are maintained until they are no longer needed.

Transport of noncompliant cylinders will begin after a DOT exemption is in place. A separate transportation plan will be issued for noncompliant cylinders prior to transport. Very limited sampling indicates there may be as many as 3000 of the ANSI N14.1-noncompliant cylinders at the ETTP.

3. TRANSPORTATION OPERATIONS

3.1 APPLICABLE REGULATIONS

DOT in 49 CFR Part 173, subpart I, "Class 7 (Radioactive) Materials" regulates shipments of depleted, natural, and enriched UF_6 cylinders. Shipment of ANSI compliant cylinders by BJC will comply with all applicable and mandatory DOT requirements and regulations. These ANSI-compliant cylinder shipments are no different from the routine shipments made historically.

49 CFR 173.420 requires that each UF_6 cylinder be designed, fabricated, inspected, tested, and marked in accordance with the version of ANSI N14.1, *Uranium Hexafluoride - Packaging for Transport* that was in effect at the time the cylinder was manufactured. Although a detailed discussion of UF_6 transportation requirements is not included here, three provisions in 49 CFR 173.420 and ANSI N14.1 are particularly important relative to DUF_6 cylinder shipments:

1. A cylinder must be filled to less than 62% of the certified volumetric capacity (the fill-limit was reduced to 62% from 64% circa 1987).
2. The pressure within a cylinder must be less than 14.8 psia per DOT.
3. A cylinder must be free of cracks, excessive distortion, bent or broken valves or plugs, broken or torn stiffening rings or skirts, and must not have shell thicknesses that have decreased below a specified minimum value. (Shell thickness may be determined when needed by ultrasonics at the request of the Code Vessel Inspector.)

Cylinders not meeting these requirements are referred to as being overfilled, overpressurized, or damaged. These cannot be shipped as ANSI N14.1- or DOT-compliant nonoverpacked cylinders without correcting the nonconforming condition, or obtaining an exemption from DOT for shipment. BJC will not ship any nonconforming cylinders as part of this plan.

ANSI N14.1 and DOT require that for fissile excepted (no overpack needed) cylinders shipped as UF_6, the total plutonium (Pu) and ^{233}U content do not exceed 1% of the ^{235}U content and the contents cannot exceed 1 wt % enrichment in ^{235}U. 49 CFR 173.403 states that "Unirradiated uranium means the uranium contains not more than 10^{-6} grams of Pu per gram of U-235, and a fission product activity of not more than 9 MBq of fission products per gram of U-235." In some cases, contamination from recycled uranium will be included in the cylinders, and may include isotopes outside the natural uranium chains, including isotopes of cesium (Cs), technetium (Tc), neptunium (Np), americium (Am), ruthenium (Ru), and Pu, usually at trace levels. Transuranics approach levels of concern only in cylinders previously used to transport or store recycled uranium (reactor returns).

These nonuranium isotopes are only in significant concentrations in cylinders that contain nonvolatile heels, particularly those that have been refilled and emptied repeatedly without cleaning internally. The isotopes of concern are ^{99}Tc and the transuranic (TRU) isotopes. BJC will characterize the population of cylinders, insofar as TRU and ^{99}Tc content, through a combination of process knowledge and sampling and analysis, as required, to verify ANSI N14.1 compliance prior to shipping. ^{137}Cs and ^{99}Tc have been detected at low levels; and other fission products have not been detected in more than trace quantities in recycled uranium. Of the TRU isotopes, only ^{237}Np, ^{241}Am, and isotopes of Pu have been detected routinely in recycled uranium.

3.2 LOADING METHODS

Forty eight-inch diameter cylinders will be loaded onto common carriage 48-ft, steel, open flat-bed trailers or double drop-deck lowboy trailers inside the ETTP site boundaries. BJC will use the Allied Wagner cylinder handler (NCH-35, see Fig. 3), a Gerlinger straddle carrier (see Fig. 2), or a crane for loading. Trailers are modified for large diameter cylinders by installation of custom wooden cylinder saddles or wedges onto the bed (see Fig. 4). The saddles or wedges are bolted-on #1 hardwood. The use of this type of dunnage precludes a side-to-side movement of cylinders or contact of the cylinder stiffening rings on the transport-vehicle trailer bed. For loading 48-inch flatbed type trailers, the Allied Wagner lifts cylinders with a hydraulic grappler arm that extends around the cylinder body, while a crane lifts from an "H" fixture attaching the crane's cable hook by four chains to the lifting lugs installed on the

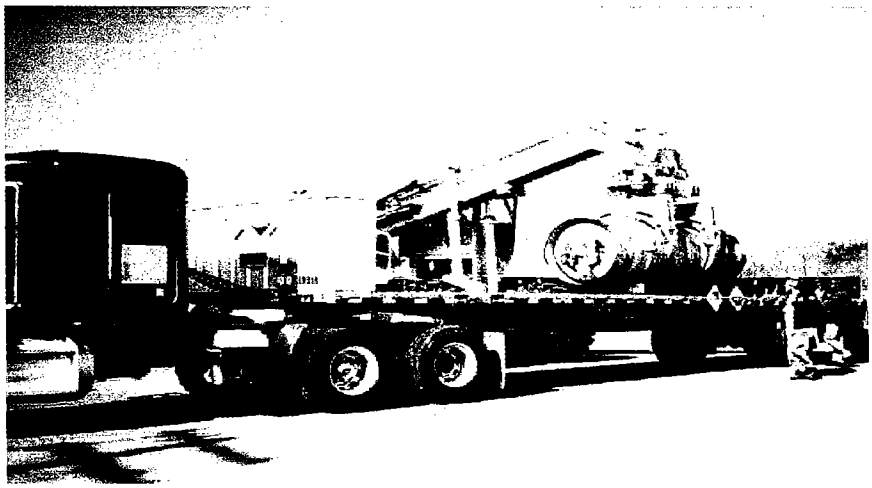

Fig. 3. Allied Wagner NCH-35 cylinder stacker loading flat bed trailer.

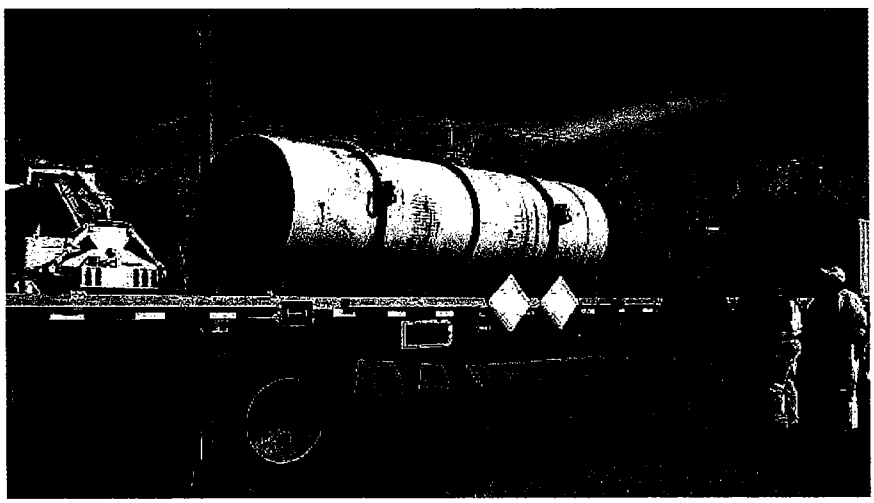

Fig. 4. UF_6 cylinders transported by truck

cylinder by the manufacturer. For loading double drop-deck lowboy type trailers, the drop-deck lowboy is positioned on flat, stable ground and the Gerlinger Straddle Carrier is driven onto the trailer, then the cylinder is placed into wooden saddles or between wooden wedges on the trailer bed. Blocking, bracing, and tie downs will include certified chains, chain binders, and straps that meet the applicable requirements of the DOT Federal Motor Carrier Safety Regulations (FMCSR), and the particular blocking and bracing requirements for carriage by public highway of the DOT HMR 49CFR Part 177. Following are the specifications of the tie downs that will be used on 48-inch cylinders:

Chain:
Number of chains per truck: 4
Chain specification: 5/8" (16mm), 10' length, Grade 7 transport marked, steel
Chain hooks, 8 each (two per chain end), Grade 7 transport marked, steel
Working load limit: 15,800 pounds

Chain Binders:
Number of binders per trailer: 4
Binder type: dogleg or ratchet type, Grade 7 transport marked, steel, with hooks
Working load limit: 16,000 pounds

Straps:
Material: synthetic webbing
Number: two straps per trailer
Size width: 3"
Working load limit: 9,000 pounds, marked and ANSI B30.9 inspected
Type: either trailer integral ratcheting type or hand ratcheting type with hooks

Shackles:
4 each per trailer (to attach chain to cylinder lifting lugs)
Size: 1 1/8" bolt shackle, bolt type with nut and cotter pin
Construction material: carbon steel
Working load limit minimum: 16,000 pounds

Sample size cylinders will be packaged in DOT-approved containers and then blocked, braced, and tied down on the transport vehicle. Fork trucks may handle and load small diameter (less than 30-inch) cylinders. Multiple heel quantity cylinders will be loaded onto a single conveyance for shipment. Two full 48-inch diameter 14-ton cylinders cannot be loaded together on a conventional weight flatbed or lowboy trailer due to highway weight restrictions.

3.3 ROUTING

Although highway route controlled quantities are not involved and shipments will be DOT-compliant, a preferred and alternative route was established in consultation with the states. The specific primary and alternate routes shall be made available on a "need-to-know" basis.

Alternate parking areas will be selected along the primary and alternate shipment routes as a contingency for natural, technological, or civil unrest events. Alternate parking areas other than the ETTP and Portsmouth GDP will be selected by DOE with state input. The location of these alternate parking areas will be made available on a "need-to-know" basis.

3.4 INSPECTION

Cylinder inspections to determine compliance for shipping are performed by a National Board Boiler and Pressure Vessel Inspector holding active certification status. Although the inspection consists of pressure measurement and observation for physical defects, ultrasonic thickness measurements may be called for at the inspector's direction and discretion. The pressure vessel code inspection is documented by completion of an inspection form UF6-9009 shown in Appendix A. The UF6-9009 contains essentially the same information as the UCN-9009 form provided in USEC-651. Appendix B provides a typical UF_6 Cylinder Wall Thickness Report from ET-2409, *Ultrasonic Thickness Measurements*. The minimum wall thicknesses for cylinders to be shipped in this campaign are specified in ANSI N14.1, Section 6.3.2. Inspections are performed by qualified subcontractors with BJC providing oversight. Inspection results will be made available and State personnel will be invited to participate in oversight of the inspections, at the states' option.

Prior to arrival onsite, the truck tractors and trailers will be Commercial Vehicle Safety Alliance (CVSA) certified. Before releasing a shipment, the truck tractor, trailer, driver qualifications, blocking and bracing, tie-downs, marking and labeling, placards, and shipping documents are verified for compliance with all appropriate regulations. This inspection process is similar to the CVSA Level I inspection, but does not employ computerized driver background checks because these data are available exclusively to law enforcement officers. Radiation surveys meet the requirements of the DOT HMR in 49 CFR 173.441 and 173.443. States' representatives will be permitted to participate in the inspections.

3.5 TRACKING

Tracking of shipments will rely on the DOE's Tracking and Communication System (TRANSCOM). State personnel will be able to track each shipment via TRANSCOM from the time of departure through arrival at Portsmouth.

3.6 EMERGENCY RESPONSE

The States and local responders have primary responsibility for response to an incident or accident involving shipments of UF_6 in this campaign. BJC will provide assistance and technical information to the responders. DOE will assist emergency responders in the form of training and requested information. A training workshop syllabus is included in Appendix C. Local emergency-response organizations along the transportation route are the first emergency responders in case of a transportation incident or accident involving a shipment of DUF_6. State-level hazardous materials (HAZMAT) and/or radiological response teams provide technical assistance. Such teams are activated by an Incident Commander or other appropriate State or local authority.

Federal resources are also available for technical assistance from the DOE Radiological Assistance Program in accordance with DOE Order 5530.3.

Emergency response instructions will accompany each shipment. In addition to notifying local authorities, the driver will be instructed to notify his/her dispatch, and the emergency response telephone number indicated on the shipping paper. The emergency response telephone number (manned on a 24-hr basis) in the Park Shift Superintendent's Office for the ETTP is 1-865-574-3282. Each Park Shift Superintendent has training, experience, and emergency response information for answering questions

regarding these particular hazardous materials shipments. The *2000 Emergency Response Guidebook* contains some useful information for responding to a transportation accident involving a UF_6 cylinder on Page 280, Guide 166, under Radioactive Materials – Corrosive (Uranium Hexafluoride/Water Sensitive).

3.7 CLEANUP/RECOVERY

Carriers have primary responsibility for recovery and cleanup, have recovery and emergency operation plans (Appendix D) as required by the DOT HMR, and will coordinate with State, and local agencies regarding these activities.

In case of an accident releasing radioactive material, DOE and BJC will coordinate with carriers, and with State and local authorities to ensure the cleanup is performed to an acceptable level.

3.8 CAMPAIGN SCHEDULE

The ANSI-compliant cylinder campaign covered by this plan will involve shipping an estimated 2900 cylinders without overpacks and 67 cylinders in overpacks to PORTS prior to October 1, 2004.

Information that is more specific than this plan regarding the campaign schedule will be provided only on a "need-to-know" basis.

3.9 SPECIAL CONSIDERATIONS IN PLANNING

Shipments will not be made in adverse weather conditions (i.e., tornado, hurricane, ice storm, or snowstorm) based on weather advisory to be provided by the States. Shipments will occur, to the extent possible, during daylight hours and at times that attempt to avoid high-traffic conditions (i.e., Kentucky State Fair, Kentucky Derby). Fuel stops will be avoided to the extent possible while transport vehicles are loaded with cylinders. A driver's pool list will be provided to State authorities prior to commencement of the shipping campaign.

4. COMMUNICATIONS

4.1 PRE-NOTIFICATION

BJC will obtain approval from DOE prior to initiating the shipment campaign. Campaign notification to Tennessee will be to the TDEC and Tennessee Emergency Management Agency (TEMA) following the Tennessee Oversight Agreement by BJC.

DOE will notify the Emergency Management agencies of Kentucky and Ohio prior to initiating a shipment campaign.

States will be notified at least two weeks prior to initiating the shipping campaign. After this initial notification, the notification of each individual shipment, as well as real time conveyance position tracking, will be provided via TRANSCOM, and States will have the opportunity to participate in tracking through use of this technology.

4.2 EMERGENCY COMMUNICATIONS

Each transport vehicle will be equipped with a citizen's band radio, a cellular telephone, and a direct transporter communication system for contact with the dispatcher, as well as the TRANSCOM system. Direct communication with drivers via cell telephones is made through the ETTP for emergencies only.

4.3 PUBLIC INFORMATION

DOE will provide a fact sheet on UF_6 for dissemination to local communities by the States. The States will provide public notification along the routes. DOE will assist in preparation of a press release.

Requests for information made by the public should be directed to the DOE Public Information Office at 1-865-576-0888.

5. ROLES AND RESPONSIBILITIES

5.1 U. S. DEPARTMENT OF ENERGY

DOE is the owner of the cylinders and their contents, which are being shipped as DOT-compliant non-highway-route controlled quantity shipments in interstate commerce. DOE has the primary authority and responsibility for control of the cylinder contents following the Atomic Energy Act of 1954 as amended, as well as responsibility for conversion of the material. DOE will select the route, approve the initiation of the campaign, provide notifications to States regarding schedule and routing, and provide information and training assistance as needed to support the shipping campaign. DOE will provide staff and materials to support train-the-trainer, tabletop, and first responder training sessions.

5.2 BECHTEL JACOBS COMPANY LLC AT THE EAST TENNESSEE TECHNOLGY PARK

BJC is the DOE Prime Contractor that operates the UF_6 cylinder yards at the ETTP as well as managing DOE-owned UF_6 cylinders at the PORTS GDP. BJC will coordinate planning of the shipments. BJC will act as shipper, receiver, inspector of cylinders, and conveyances, prior to and following shipments; and, through the ETTP Shift Superintendent's Office, will provide 24-hour notification and information in case of an accident or incident.

As the shipper, BJC is also responsible for proper classification, marking, labeling, packaging, placarding, preparing shipping documents, certification, blocking, and bracing.

5.3 BECHTEL JACOBS COMPANY LLC AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT

The cylinders will be received at the PORTS GDP by BJC, and stored pending conversion or other disposition. Depleted assay cylinders will be converted to a different chemical form at a new plant to be constructed on the PORTS GDP site. Following conversion, it is anticipated that the converted material will be transported to a DOE site in the Western United States for long term storage. ETTP cylinders containing normal or enriched material represent a very small fraction of the normal and enriched material already onsite at the PORTS GDP, where they will be stored until the economic and technical feasibility of recycle and recovery have been fully evaluated.

5.4 CARRIERS

The carriers are Visionary Solutions LLC, A.J. Metler Company, Intersate Freight Inc., and Southern Freight Logistics. Pursuant to DOT regulations, the carriers are responsible for:

- securing their loads,
- maintaining the shipping papers and emergency plans onboard,
- timely reporting of any incident or accident to their dispatcher and to the shipper through the ETTP PSS Office,
- cleanup and recovery in the event of an incident or accident, and
- transporting the cylinders to the PORTS GDP for off loading.

The carriers will provide drivers who are at least 25 years of age, have HAZMAT endorsement, a statement of training for radioactive transport, and are native born United States citizens.

5.5 STATE OF TENNESSEE

The State of Tennessee is responsible for:

- reviewing this plan and providing input during transportation planning,
- informing local authorities of the campaign,
- providing training and informational support to local authorities,
- maintaining the highway infrastructure,
- determining the need for and requiring the evacuation or sheltering in place of affected residents,
- supporting and advising local first responders,
- providing radiological direction for contamination control,
- providing radiological protection services and response within the State, and
- providing advisories regarding adverse weather conditions for shipments.

5.6 COMMONWEALTH OF KENTUCKY

The Commonwealth of Kentucky is responsible for:

- reviewing this plan and providing input during transportation planning,
- informing local authorities of the campaign,
- providing training and informational support to local authorities,
- maintaining the highway infrastructure,
- determining the need for and requiring the evacuation or sheltering in place of affected residents,
- supporting and advising local first responders,
- providing radiological direction for contamination control,
- providing radiological protection services and response within the State, and
- providing advisories regarding adverse weather conditions for shipments.

5.7 STATE OF OHIO

The State of Ohio is responsible for:

- reviewing this plan and providing input during transportation planning,
- informing local authorities of the campaign,
- providing training and informational support to local authorities,
- maintaining the highway infrastructure,
- determining the need for and requiring the evacuation or sheltering-in-place of affected residents,
- supporting and advising local first responders,
- providing radiological direction for contamination control,
- providing radiological protection services and response within the State, and
- providing advisories regarding adverse weather conditions for shipments.

5.8 SOUTHERN STATES ENERGY BOARD

The Southern States Energy Board is responsible for advising its members, including the State of Tennessee, and the Commonwealth of Kentucky, on issues relating to nuclear energy and nuclear safety, (i.e., the transportation of radioactive materials and fuel cycle materials).

5.9 COUNCIL OF STATE GOVERNMENTS MIDWESTERN OFFICE

The Council of State Governments Midwestern Office provides research and advisement to its member states, including the State of Ohio and the Commonwealth of Kentucky, on issues including the transportation of radioactive materials, routing of shipments, public involvement in DOE decision-making, and emergency response to transportation accidents involving radioactive and hazardous materials.

6. POINTS OF CONTACT

Department of Energy

Transportation Operations – Brady Lester, 865-576-8354
ETTP Site Office – David Hutchins, 865-241-6420
Emergency – ETTP Shift Superintendent's Office, 865-574-3282
Public Information – Steven L. Wyatt, 865-576-0888

BJC at the ETTP

Operations – Halen Philpot, 865-576-4525
Emergency – ETTP Shift Superintendent's Office, 865-574-3282
Public Information – Steven L. Wyatt, 865-576-0888
Transportation Operations – Dooley H Buckner, 865-241-2473

BJC at Portsmouth

Operations – Mike Eversole, 740-897-2362
Emergency – USEC Plant Shift Superintendent's Office, 740-897-3025
Public Information – Sandy Childers, 740-897-2336

State of Tennessee

Emergency Management – Elgin Usery, 615-741-2879
Health – Joe Phillips, 615-741-2584
Transportation – Steve Borden, 865-584-2458

Commonwealth of Kentucky

Emergency Management – Homer Druin, 502-607-1661
Health – Robert Johnson, 502-564-3700
Transportation – Joe England, 800-255-2587

State of Ohio

Emergency Management – Thomas Breckenridge, 614-799-3651
Health – Robert Owen, 614-644-2732
Transportation – Carlisle Smith, 614-728-9126

Southern States Energy Board

Cristopher Wells, 770-242-7712

Council of State Governments Midwestern Office

Lisa Sattler, 920-803-9976

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Appendix A
ANSI N14.1 Compliance ASME/NBIC Code Vessel Compliance Inspection Data
(TYPICAL UF_6 CYLINDER INSPECTION DATA SHEET)

CYLINDER NUMBER	CYLINDER MODEL		CYLINDER BEING INSPECTED
Cylinder is Code Stamped __ YES __ NO	__ 30A (2 ½-ton) __ 30B (2 ½-ton) __ 48A (10-ton) __ 48X (10-ton) __ 48T (10-ton) _____	__ 48F (14-ton HW) __ 48Y (14-ton HW) __ 48G (14-ton LW) __ 48H (14-ton LW) __ 48OM (14-ton LW) __ _____	__ PRIOR TO BEING SHIPPED __ AFTER BEING RECEIVED
Valve Pressure Inches Hg _____ _____ psia		WATER CAPACITY _____	

CYLINDER IS OVERFILLED:
__YES __NO Net weight is _____ pounds: Maximum Fill Limit is _____
__ Calculated __ Minimum

		7. CONDITION		
		Acceptable	Unacceptable	Not Applicable
	A. VALVE PORT			
	1. Plugged with UF_6 _____			
	2. Contaminated with Other U-Salts or Foreign Material _____			
	B. VALVE PROTECTOR			
	1. Present and Properly Positioned _____			
	2. Sealed _____			
I. CYLINDER VALVE, VAVLE PORT, AND 7.1 PLUGS	*THIS SECTION TO BE COMPLETED BY QUALIFIED ANSI INSPECTOR*			
	C. VALVE			
	1. Valve Type _____			
	2. Physical Damage _____			
	3. Thread Engagement _____ (Threads showing _____)			
	4. Valve Cap – Present and in Place _____			
	D. PLUGS			
	1. Physical Damage _____			
	2. Thread Engagement _____ (Threads Showing) _____			
	3. Sealed _____ _____			
	Description of Damage (if any) _____			
II. CYLINDER WELDS	A. CIRCUMFERENTAIL HEAD SEAM WELD – VALVE END _____			
	B. CIRCUMFERENTIAL HEAD SEAM WELD – PLUG END _____			
	C. LONGITUDINAL SEAL WELD _____			
	D. LIFTING LUGS – WELD _____			
	Description of Damage (if any) _____			
III. CYLINDER SHELL AND HEADS	A. SHELL _____			
	B. HEAD-VALVE END _____			
	C. HEAD-PLUG END _____			
	Description of Damage (if any) _____			
IV. STIFFENING RINGS	A. VALVE END _____			
	B. CENTER _____			
	C. PLUG END _____			
	Description of Damage (if any) _____			
V. SKIRTS	A. VALVE END _____			
	B. PLUG END _____			

Appendix A
ANSI N14.1 Compliance ASME/NBIC Code Vessel Compliance Inspection Data (Continued)
(TYPICAL UF_6 CYLINDER INSPECTION DATA SHEET)

	Description of Damage (if any) _____			
SECTION A	REMARKS			
		DATE	QUALIFIED INSPECTOR	
	The above item(s) is 9 Acceptable 9 Unacceptable			
SECTION B	THIS SECTION TO BE COMPLETED WHEN THE DAMAGE ABOVE IS EVALUATED BY OTHER THAN QUALIFIED ANSI INSPECTOR PERSONNEL The following damage has been evaluated and disposition is :			
	APPROVED BY	TITLE	DATE	

UF6-9009 (2/04)

Note: The above is a typical form illustrating the content and not the format of inspection data. The actual form used may be revised as needed without revision to transportation plans.

Appendix B
Ultrasonic Thickness Inspection Form
From ET-2409

UF6 Cylinder Wall Thickness Report

Date (OTM) _____

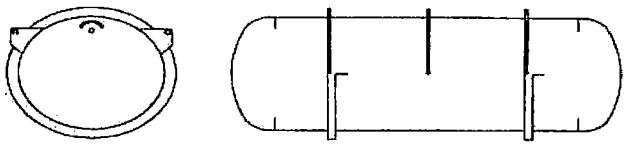
Date (TMA) _____

Cylinder No: _____ Yard: _____ Section: _____

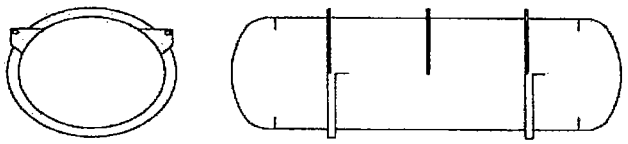
Row: _____ Position: _____ Cylinder Model: _____

Nominal Weight: _____

Valve Head Valve End Top View Plug End



Plug Head Plug End Bottom View Valve End



Original Thickness Measurements			
I	II	III	IV

Thickness Measurement Areas			
	A	B	C
1			
2			
3			
4			
5			
6			

	Result	Date	Time	Calib. (OTM/TMA)
Instrument Type: _____ Initial Calibration:				
Final Calibration:				
Initial Calibration:				
Final Calibration:				

Surface Preparation Performed Using: _____ Probe: _____

Surface Condition As Prepared: _____

Surface Condition As Found: _____

Comments: _____

Inspector: _____

Signature: _____

Appendix C
Workshop Syllabus for Training of UF_6 Emergency Response Personnel

- ***Purpose:***

To provide awareness training for emergency response personnel as it relates to the packaging, transportation, and emergency response provisions associated with the transport of UF6 cylinders from Oak Ridge, TN to Portsmouth, OH.

- ***Instructional Objectives:***

1. To provide an overview of the physical and chemical hazards associated with UF_6.
2. To explain the rationale for transporting UF_6 cylinders from Oak Ridge to Portsmouth.
3. To provide an awareness of the chemical hazards water can have upon UF_6.
4. To address DOT's hazardous materials regulations that pertain to the marking, labeling, placarding, and communication requirements for shipments of radioactive materials.
5. To convey a commitment from DOE that all safety considerations are being addressed prior to and during shipments.
6. To provide emergency response personnel with resource material that can be utilized after training.
7. To explain the DOE radioactive materials response capabilities that are available through DOE's Radiological Assistance Program.

- ***Instructional Setting:***

Sessions are instructor led. Instructors utilize a training manual jointly produced by the State of Kentucky Emergency Management Agency and the Department of Energy. Sessions are designed to be 2 ½ hours in length.

- ***Training Population:***

The instructional content is designed for law enforcement personnel, volunteer firefighters, hazmat team members, emergency management coordinators, and paid firefighters who could be called to an incident involving UF6.

Appendix D
Carriers' Emergency Recovery Plan for the Shipment of UF_6 Cylinders

INTRODUCTION

The DOE Emergency Recovery Plan identifies emergency planning and preparedness considerations and establishes emergency response roles and responsibilities for incidents/accidents involving shipments of UF_6 cylinders from ETTP to Portsmouth.

NOTIFICATIONS AND COMMUNICATIONS

ETTP will provide shipper-related emergency information and maintain a 24-hour emergency telephone contact list (Table 1) for technical advice and detailed information regarding these shipments.

EMERGENCY PREPAREDNESS

The State and local governments having jurisdiction over areas through which these shipments will pass have the responsibility for protecting the public and the environment and for establishing incident command should there be an incident/accident involving these shipments. The carriers for these shipments are responsible for providing emergency response assistance and recovery/restoration actions, if required. The appropriate Federal, State, or local government authority will also have the responsibility for recovery/restoration oversight activities at the incident scene. DOE will provide technical advice and assistance to these authorities and ensure the carrier of these shipments performs the necessary cleanup and site recovery/restoration activities.

To provide an adequate response for transportation incidents/accidents, State and local governments are responsible for developing emergency response plans and procedures; organizing, training, and deploying first responders; and negotiating mutual aid agreements for incidents/accidents close to jurisdictional boundaries.

To assist State and local agencies, DOE has developed planning and training materials through the Transportation Emergency Preparedness Program (TEPP) to help provide the incremental skills necessary for response to incidents/accidents involving DOE radioactive material shipments. In addition, each DOE Regional Coordinating Office (see Figure 1) has appointed a TEPP Coordinator to ensure emergency planning and preparedness activities are integrated into the transportation planning process. The TEPP Coordinator can provide assistance to State and local agencies in preparing for DOE transportation activities (e.g., assist in using TEPP planning products, coordinate delivery of DOE training, provide technical assistance, resolve emergency preparedness issues, etc.). DOE TEPP Coordinators are identified in Table 1.

EMERGENCY RESPONSE

The following establishes roles and responsibilities for the emergency response organizations supporting this plan:

CARRIERS

Visionary Solutions, LLC (VS), Metler, Southern Freight Logistics, and Interstate Freight, maintain ongoing emergency response plans that work at all levels of staff. Management maintains a systematic flow and exchange of information that ensures, in the event of an accident, that appropriate authorities are notified within the time frames set by the Department of Transportation (DOT) and the Environmental Protection Agency (EPA). All drivers are routinely trained and provided updates on steps to be undertaken in the event of an accident. Professional commitment to a comprehensive driver and supervisory training program enables compliance with all provisions of DOT and EPA as well as the Customer requirements to be fulfilled. The driver, if able, will complete the actions provided in Attachment 1. Key components of this plan include:

- Emergency telephone numbers are provided to each driver.
- A maintenance contract is maintained for each trailer and tractor.
- Road service is provided for equipment repairs.
- Emergency reporting will be completed by the appropriate transportation emergency personnel.
- Contractor health physics and spill response personnel and equipment at the direction of DOE if the State requests such assistance from DOE in the event of an accident.
- The shipments will be monitored by TRANSCOM and FleetView to increase security along the route.

VS will be the primary point of contact for trailer maintenance/repair issues since VS is providing the trailers for all shipments. Metler, Interstate Freight, and Southern Freight Logistics will each be responsible for the tractors used by each to move the shipments. A summary of the systems for each are provided below.

Visionary Solutions, LLC

Visionary Solutions, LLC (VS) contracts with a national service to provide road side assistance. If a trailer breaks down (flat tire, loss of lights, etc.), RoadWatch (1-800-325-1453, option #1) is available 24 hours per day and 7 days per week. RoadWatch ensures that a trailer with any tire related problem will be back on the road within 3 hours of notification. RoadWatch has access to over 55,000 repair vendors across the United States and Canada. If repairs are severe, RoadWatch will arrange for towing to a nearby facility. All trailers and tractors will be inspected by the driver prior to movement of the shipment from ETTP to ensure that all parts and systems are in working order. If there is a problem detected, the truck will not leave and may be either repaired on site or transferred to a maintenance facility in Knoxville.

The trailers will be equipped with FleetView, a cellular based trailer tracking device from Terion, Inc., to help improve trailer utilization and security of the load. FleetView combines satellite and cellular technology to provide accurate, real-time information about untethered trailers. Once activated, the trailers can be tracked anytime, 24 hours per day. FleetView provides information such as what direction the trailer is moving, if it is moving or idle, how far it has traveled, what city it is in, or the largest city close to it, etc.

VS has contracted with Safety and Ecology Corporation (SEC) to provide spill response in the event of an incident for which the state requests assistance from DOE. SEC provides this service to others such as Norfolk Southern Railroad. The contract requires mobilization within 6-12 hours which includes notification, consultation, site control, interface with regulators, and arrival at the site. The on site assessment will be completed in 24-36 hours. Stabilization and recovery as well as the site remediation and final report will be completed as quickly as possible depending upon the level and degree of contamination. SEC provides health physics support and equipment to determine the extent of contamination. Equipment provided includes but is not limited to survey meters/probes, consumables, air samplers, high-range extendable probe dose rate meters, personal protective equipment (PPE) including respiration protection, power supply, communications, and a portable meteorological station.

Two crane companies, Barnhart Crane and Rigging in Knoxville, TN and Duncan Machinery Movers in Lexington, KY, are also under contract to provide assistance in the event of an incident enroute involving the UF_6 cylinders requiring such services. The company closest to the incident will be called. Mobilization will be within four hours after notification with travel time added to that. Therefore, it is estimated that response time will be within six to seven hours at a maximum.

Primary: Allen Neal
Work (865) 482-3896
Cell (865) 604-9436
Home (865) 947-6670

Secondary: Don Lane
Work (865) 482-3896
Cell (865) 771-0162
Home (423) 369-4180

Tertiary: Cavanaugh Mims
Work (865) 482-8670
Cell (865) 300-1605
Home: (865) 531-3543

Safety and Ecology Corporation will be contacted by VS in the event of a spill. The 24 hour emergency contact for SEC is Neil Kiely at 888-717-9225.

Metler

A maintenance contract is maintained with IDEALEASE (NAVISTAR) and OVER THE ROAD BREAKDOWN SERVICE at 1-800-435-3273. Maintenance and road service is available for dispatch of equipment repairs by contacting Bob Monday (423) 637-4661. Along the predetermined shipping route, Metler maintains contractual arrangements with various tire services. This system is maintained by Charles Strader, Sr.

Primary: Preston Cunningham
Work: (865) 524-5592 ext 167
Home: (865) 938-0700
Cell: (865) 556-5592

Secondary: Debbie Davis
Work: (865) 524-5592 ext 105
Home: (865) 475-4636

Tertiary: Metler/Pemberton service center
After Hours (865) 524-5592 ext 128
Anthony Metler (865) 984-9942
Walter Nicholson (865) 475-4235

Southern Freight Logistics

Southern Freight Logistics has established a maintenance contract with Hubbard Trucking & Repair Services of London, KY. Maintenance and equipment repairs or over-the-road breakdown services are dispatched by contacting Mr. Bill Hubbard. Southern Freight Logistics has selected various vendors along the route who will provide tire services. Bill Hubbard can be contacted at (606) 309-6677 (24/7 #) or (606) 878-1436.

Primary: Mark Shearin
Work: (865) 241-4860
Home: (865) 966-2116
Cell: (865) 919-5197

Secondary: John Faust
Work: (865) 241-5003
Home: (865) 426-6657
Cell: (865) 567- 6309

Tertiary: Connie McGee
Work: (865) 241-4816
Cell: (865) 591-6922

Interstate Freight

Interstate Freight has a contract with Shaw Environmental and Infrastructure, Inc. (800) 537-9540 for emergency response. Various local vendors along the route provide over-the-road breakdown service. Maintenance is by Robert Smith, shop foreman, who can be contacted at (205) 338-9083 or (205) 884-2141. McGriff Tire is under contract for tire repairs, and the contact is Bubba Bryant at (205) 326-6076 or (205) 253-7854.

Primary: Debbie Hammet
Work: (205)338-9595
Home: (256) 442-4823
Cell: (256) 390-3622

Secondary: Jim Johnson
Work: (205) 338-9595
Home: (205) 525-1550
Cell: (205) 812-9908

Tertiary: Charles Browning
Work: (205) 338-9595
Home: (205) 338-6998
Cell: (205) 915-3835

First Responders

First Responders will respond to the incident scene and initiate response actions in accordance with local plans and procedures and the *Emergency Response Guidebook* (ERG2000). Guide 166 applies to the materials involved in these shipments (UN 2978) and provides information on potential hazards, public safety concerns, and emergency response actions. Emergency response information accompanying the shipping papers, normally available to responders from the ETTP emergency contact or accessible via TRANSCOM, should also be consulted. The ERG2000 or other appropriate guidelines should be used for the initial response to other hazards that could be involved at the incident scene. In all cases, the incident Commander for response to the ETTP UF_6 shipments will be a local or State authority. If State or local responders have additional procedures that provide more specific guidance, then responders will follow those procedures.

State-Level Hazardous Materials (HAZMAT) or Radiological Response Teams

Some states maintain specialized HAZMAT and/or radiological response teams that may be activated to provide technical assistance and mitigation during emergencies. State teams are activated by the Incident Commander or other appropriate State or local authority.

ETTP Park Shift Superintendent (PSS)

In the event of a transport accident or other incident (e.g. public protest), the on-scene local or State official will provide the ETTP PSS 24-hour emergency notification number (865-574-3282) with the initial notification. The Emergency Coordinator will mobilize DOE emergency support if requested, maintain communication with the on-scene officials, and inform DOE ORO and other contacts as necessary. See Figure 2 for a flow diagram of contacts. PSS will also monitor TRANSCOM to observe the movement of these shipments.

DOE Oak Ridge Operations

DOE will coordinate with responding Emergency Public Information officials, and if requested, deploy resources based on the location of the accident/incident.

DOE ORO has lead responsibility for the safe and efficient transport of the UF_6 cylinders from ETTP to Portsmouth. As the originator of these shipments, DOE ORO has the primary responsibility for ensuring

appropriate response to an incident or accident involving the UF_6 cylinders regardless of its regional location. To support these shipments, DOE ORO will conduct the following activities:

- Ensure radiological surveys are performed to establish the radiological condition of the cargo shipped and to ensure compliance with DOT regulations prior to departure of the shipment from ETTP.
- Ensure the shipments are monitored on a 24-hour basis by the ETTP PSS and TRANSCOM.
- Ensure all notifications are completed in accordance with established procedures.
- Implement emergency response actions in accordance with established procedures if the ETTP PSS Incident Commander declares an Operational Emergency for an accident involving these shipments.
- Notify the Regional Coordinating Office of the affected region and request assistance in notification of and coordination with local and State authorities.
- Provide assistance with mobilizing emergency response teams upon the request of DOE or the appropriate State authority. Ensure the appropriate State authority is notified prior to deployment of emergency response teams.
- If an incident/accident occurs that requires a lengthy mitigation/recovery period, DOE ORO will coordinate with DOE-HQ and the appropriate DOE Regional Coordinating Office to identify additional DOE technical resources to deploy to the incident scene. These DOE representatives will provide additional technical assistance and support to the responsible on-scene authority.
- If an accident occurs that warrants a response under a Federal Plan (e.g., the Federal Radiological Emergency Response Plan, National Contingency Plan, Federal Response Plan), DOE ORO will coordinate with DOE-HQ and the Regional Coordinating Office in the affected region to designate a Federal On-scene Coordinator/Commander and conduct activities in support of that plan.

DOE Regional Coordinating Offices for Regions 2 (Oak Ridge) and 5 (Chicago)

- Notify ETTP and Portsmouth of any incident/accident involving these shipments within their region.
- Assist DOE ORO in notification of and coordination with local and State authorities for incidents/accidents occurring within their region.
- Provide radiological assistance, including deployment of emergency response teams, upon the request of DOE or the appropriate State authority. Ensure the appropriate State authority is notified prior to deployment of an emergency response team.
- If an accident occurs that warrants a response under a Federal Plan (e.g., the Federal Radiological Emergency Response Plan, National Contingency Plan, Federal Response Plan), DOE ORO will coordinate with DOE-HQ and the Regional Coordinating Office in the affected region to designate a Federal On-scene Coordinator/Commander and conduct activities in support of that plan.

Recovery

The carriers have primary responsibility for transporter recovery operations as described under carrier responsibilities above. Recovery will not begin until the emergency phase of any incident/accident is terminated. Recovery operations will be coordinated with the Incident Commander and/or the State on-scene authority. DOE ORO will assist the carriers and subcontractors in recovery operations, where appropriate.

ATTACHMENT 1

DRIVER RESPONSE ACTIONS

IMMEDIATE ACTIONS:

1. Make every reasonable effort to rescue injured or trapped persons and remove them from the immediate area.

2. Unless given by a physician, immediate first aid should be limited to those procedures necessary to save life or minimize injury.

3. Restrict access to the incident area and prevent unnecessary exposure to or handling of debris. Keep the public away from the area by isolating the area with barriers, rope, or any other means available.

4. Contain any leakage to the extent practicable to prevent flow onto ground or into waterways. Maintain a safe distance and follow the principles of radiation protection
   - Time
   - Distance
   - Shielding

5. DO NOT DRINK, EAT, OR SMOKE

6. Rely on professionals for survey and clean up activities.

NOTIFICATIONS:

1. Emergency Response contact phone number on the shipping paper.

2. State and Local Authorities – Police and fire departments, state highway patrol, public health, and civil defense.

3. Shipper/Consignee

4. Visionary Solutions, LLC

5. Carrier Representative – Either dispatcher, terminal manager, safety officer, or other company officials.

See Table 1 for specific contacts.

FOLLOW-UP ACTIONS

1. When it is necessary to send an individual to a hospital or other medical facility BEFORE a radiological emergency team or physician knowledgeable in radiological health arrives, inform ambulance and other involved personnel of the possibility of radioactive contamination.

2. Also, inform the hospital or medical facility that the individual may be contaminated. When in doubt that the radioactive material is still confined to its container, assume that the immediate incident area is radioactively contaminated and that anyone and anything in the area MAY be contaminated, taking care to minimize contact with the outer clothing of individuals and anything else in the immediate area.

3. Individuals who are not removed to a hospital or other medical facility, and are suspected of having been exposed to radioactive material, should remain in the area until they can be monitored.

4. Obtain the names and addresses of all persons involved, including those removed for medical attention and any others who may leave the area.

5. DO NOT handle, use, or remove from the area any material, equipment, or other items suspected of being radioactively contaminated unless released by radiation monitoring personnel.

6. When a transportation incident involves radioactive material, DO NOT move vehicles, shipping containers, or wreckage except to rescue people. Detour pedestrian and vehicular traffic.

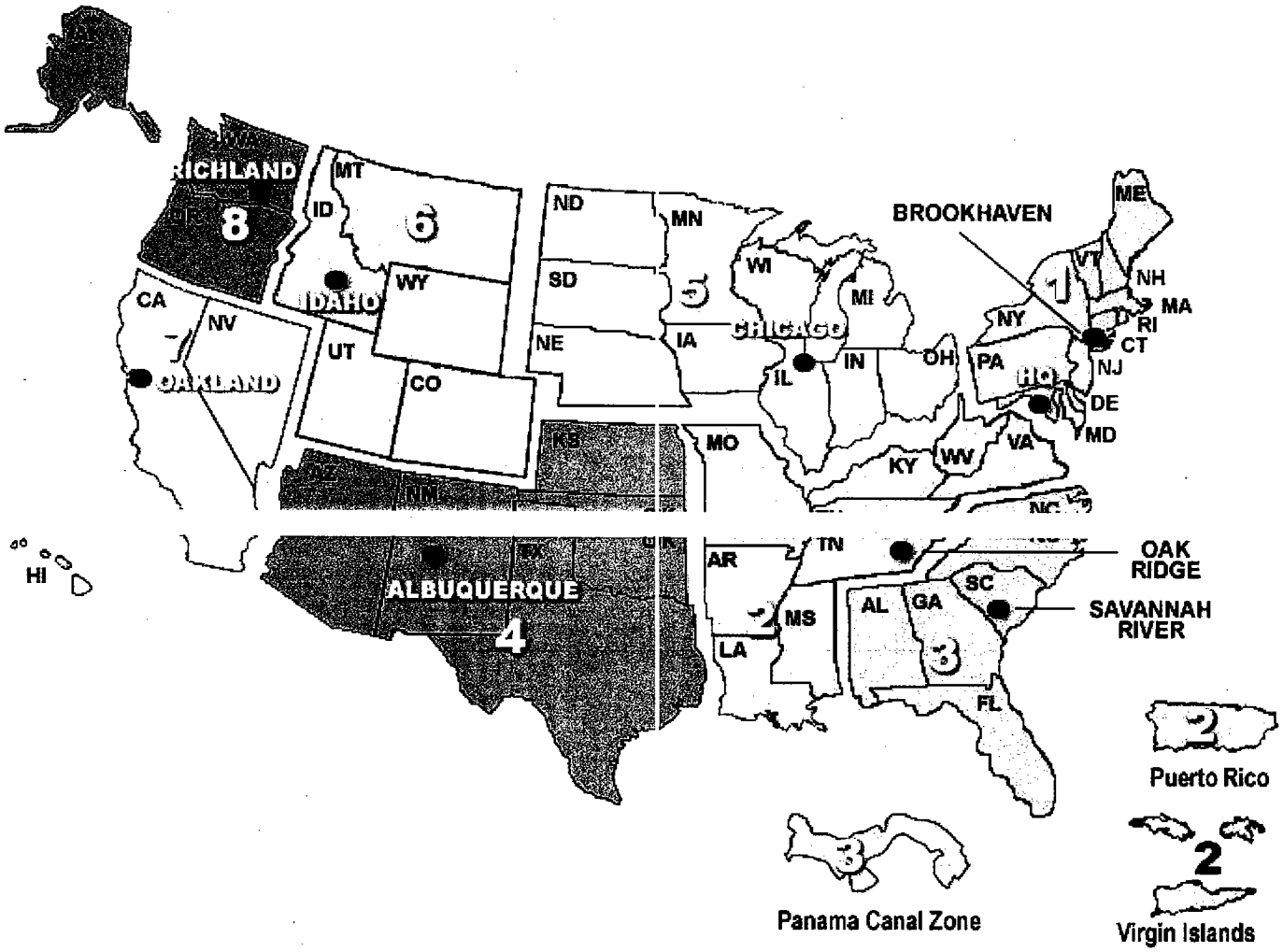
7. Fight fire as though toxic chemicals are involved. To the extent possible, keep upwind and avoid smoke, fumes and dust. Segregate clothing and tools used at the fire until they can be checked for radioactive contamination.

8. Provide as much information to emergency response personnel as possible regarding hazards, injuries, etc.

Table 1 Emergency Response Contact List			
Agency	**Contact**	**Phone**	**Email**
ETTP Park Shift Superintendent	Superintendent on duty	865-574-3282	k2a@bechteljacobs.org
DOE Region 2 Coordinator*	Brady Lester	865-576-8354	lesterpb@oro.doe.gov
Regional Coordinating Office for Region 2 RAP Teams	Steve Johnson	865-576-1005	JohnsonSM@oro.doe.gov
DOE Region 5 Coordinator*	Noelle Kostecki or Tim Larson (alt.)	630-252-2398 630-252-2055	Noelle.Kostecki@ch.doe.gov or tim.larson@ch.doe.gov
Regional Coordinating Office for for Region 5 RAP Teams	Christine Van Horn	630-252-4800	christine.vanhorn@ch.doe.gov
Bechtel Jacobs Company LLC Transportation	Dooley Buckner	865-241-2473 or 865-873-4089	bucknerdh@bechteljacobs.org
Visionary Solutions, LLC	Allen Neal	865-482-3896 865-604-9436	aneal@vs-llc.com
Metler	Preston Cunningham	865-524-5592 or 865-556-5592	NA
Southern Freight Logistics	Mark Shearin	(865) 241-4860 or (865) 919-5197	NA
Interstate Freight	Debbie Hammet	(205) 338-9595 or (256) 390-3622	NA
Safety and Ecology Corporation	Neil Kiely	865-690-0501 or 888-717-9225	nkiely@sec-tn.com
DOE Headquarters Watch Office	Staff	202-586-8100	NA
TRANSCOM Control Center	Staff	505-845-6200	NA
Tennessee	Emergency Management Agency Operations	615-741-0001 or 800-262-3300 (latter for in state)	NA
Kentucky	KY Div. of Emergency Mgmt. 24-hr Duty Officer	800-255-2587 FAX 502-607-1614	NA
Ohio	Department of Health Department of Emergency Management OEPA Emergency Response Spill Hotline	614-644-2727 614-889-7150 800-282-9378	NA

* TEPP Coordinators' numbers are not manned on a 24 hour basis.

Figure 1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HQ
HI
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ALBUQUERQUE
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AR
TN
MS
LA
AL
GA
SC
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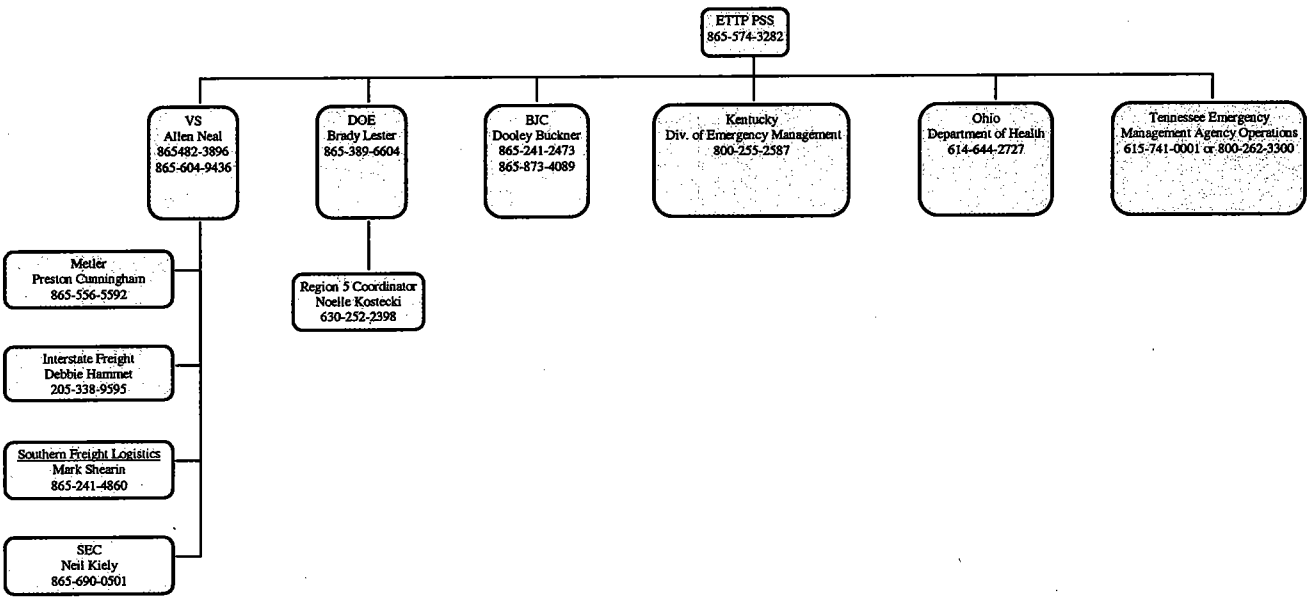
FL
OAK RIDGE
SAVANNAH RIVER
2
Puerto Rico
3
Panama Canal Zone
2
Virgin Islands

Figure 2
Emergency Contact Flow Diagram



Appendix E

DOT Exemption 11868

U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

DOT-E 11868
(FIFTH REVISION)

DEC 11 2003

EXPIRATION DATE: November 30, 2005

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: United States Enrichment Corporation
Paducah, Kentucky

(See Appendix A to this document for a list of additional grantees)

2. PURPOSE AND LIMITATION:

a. This exemption authorizes the transportation in commerce of cylinders with valves and plugs that are tinned with certain American Society of Testing Materials (ASTM) solder alloys other than those required by the American National Standards Institute (ANSI) Standard N14.1 referenced in the Hazardous Materials Regulations. This exemption does not affect the validity of U.S. Competent Authority Certificates issued for the international transportation of uranium hexafluoride. This exemption provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.

b. The safety analyses performed in development of this exemption only considered the hazards and risks associated with transportation in commerce.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 172.301(c) and 172.302(c) in that marking requirements are waived; and § 173.420(a)(2)(i) in that alternative solder alloys, as specified in paragraph 7, are authorized for tinning the cylinder valves and plugs.

5. BASIS: This exemption is based on the application of USEC dated December 2, 2003 submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101): DEC 11 2003

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identification Number**	**Packing Group**
Uranium hexafluoride, fissile *(with more than one percent U-235)*	7	UN2977	N/A
Uranium hexafluoride, fissile *excepted or non-fissile*	7	UN2978	N/A

7. SAFETY CONTROL MEASURES: PACKAGING - Cylinders which are manufactured in compliance with the ANSI Standard N14.1 except that the valves and plugs have been tinned with various solder alloys. In addition to Type 50A solder, cylinder valves and plugs may be tinned with ASTM B32, Type Sn50 solder or a mixture of two parts Type 50A or Type Sn50 and one part Type 40A or type Sn40A solder. The tin content of the mixture may not be less than 46 percent.

8. SPECIAL PROVISIONS:

a. A person who is not a holder of this exemption, but receives a package covered by this exemption, may reoffer it for transportation provided no modifications or changes are made to the package and it is offered for transportation in conformance with this exemption and the HMR.

b. A current copy of this exemption must be maintained at each facility where the package is offered or reoffered for transportation.

c. MARKING - The marking requirements of §§ 172.301(c) and 172.302(c) are waived.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel and cargo aircraft only.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each aircraft used to transport packages covered by this exemption. The shipper must furnish a current copy of this exemption to the air carrier before or at the time the shipment is tendered.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

    - o All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
    - o Registration required by § 107.601 et seq., when applicable.

    Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

    No person may use or apply this exemption, including display of its number, when the exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS: The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (Sections 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must inform the AAHMS, in writing, of any incident involving the package and shipments made under the terms of this exemption.

Issued in Washington, D.C.:

for Delmas F. Billups

Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

DEC 11 2003
(DATE)

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590. Attention: DHM-31.

Copies of this exemption may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/exemptions Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

PO: sln